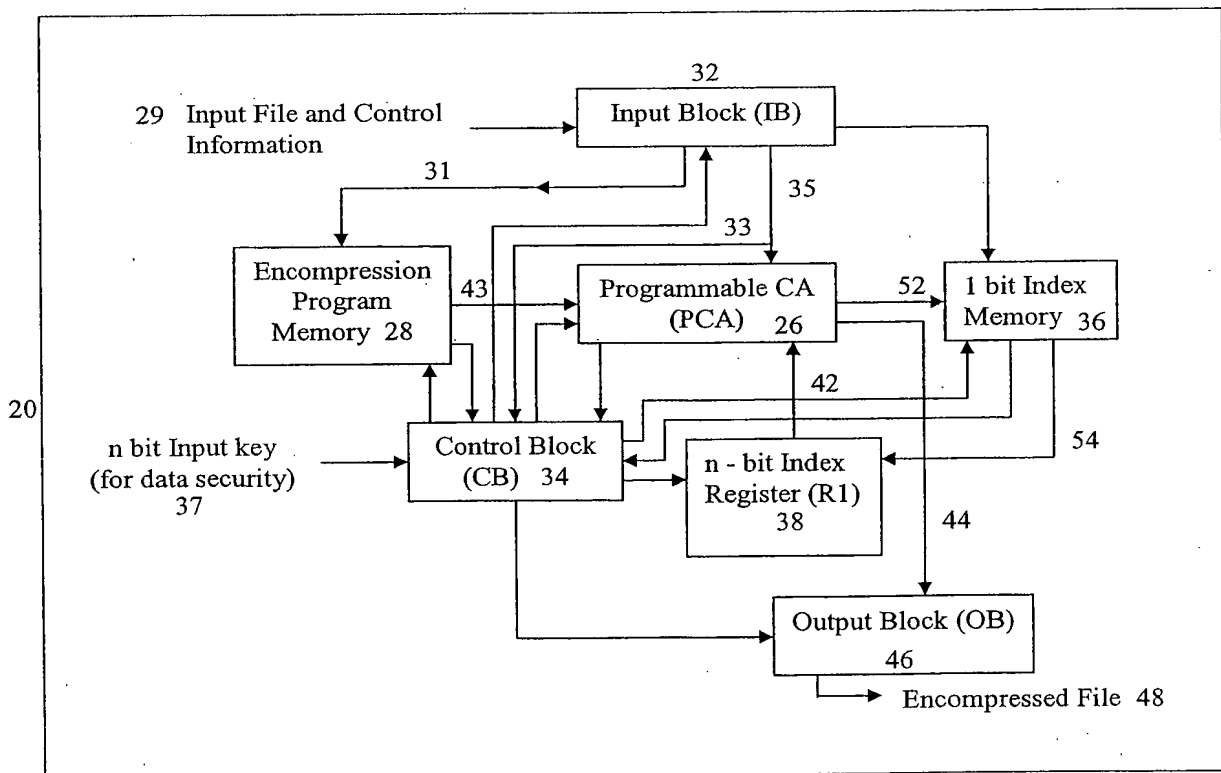
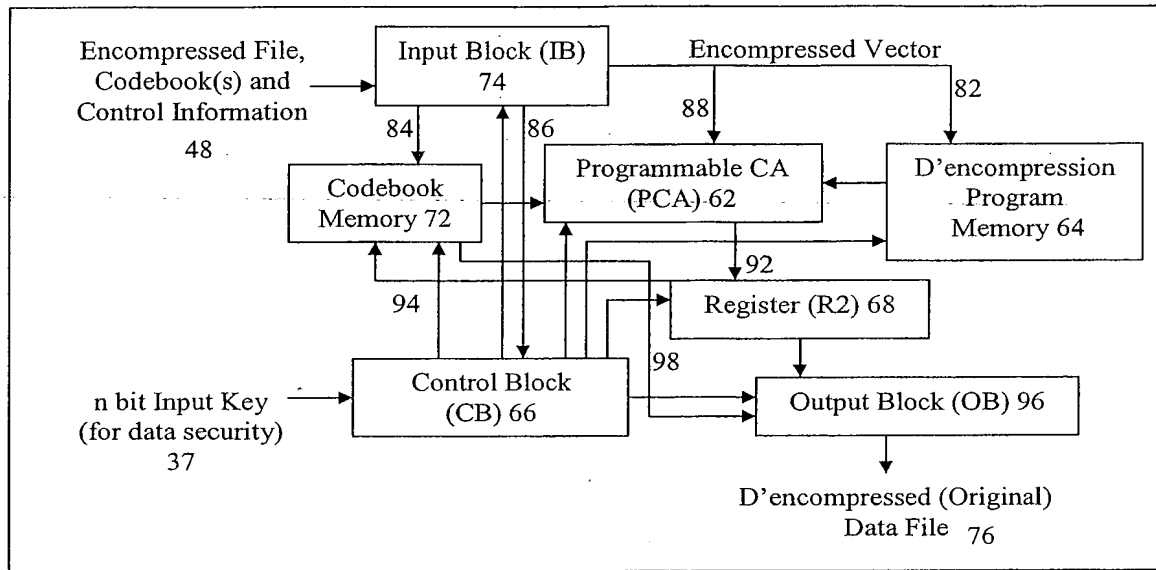


(a) Encompression and D'encompression of Digital Data File



(b) The Encompression module

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(c) The D'encompression module

Fig 1. The basic architecture and Encompression / D'encompression module

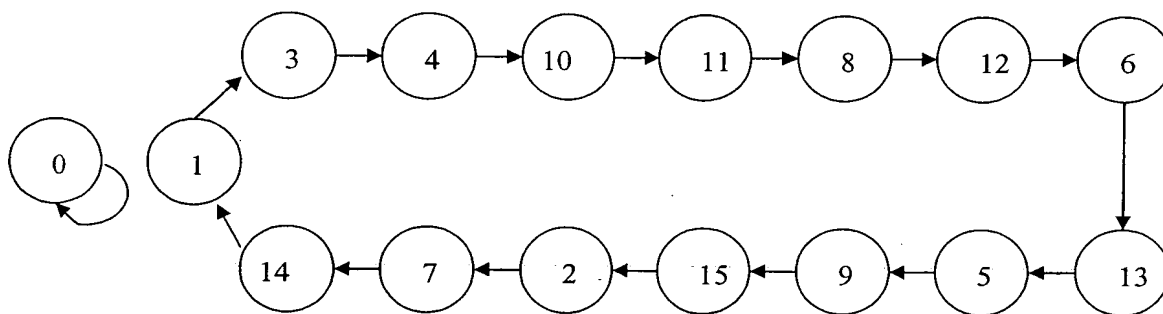


Fig. 2. State transition diagram of a maximum length group CA

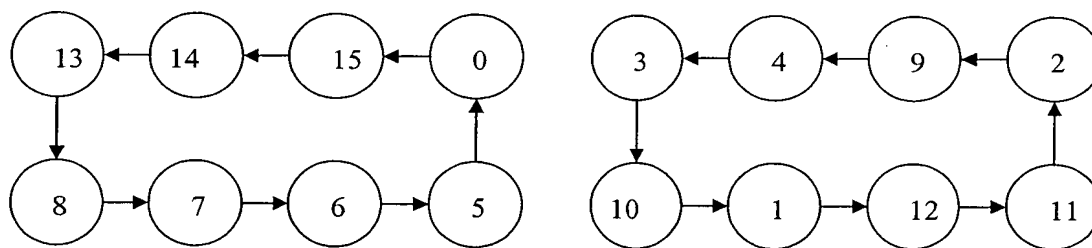
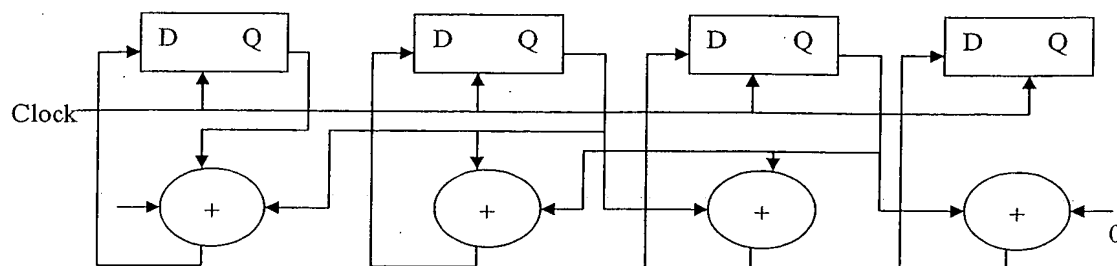
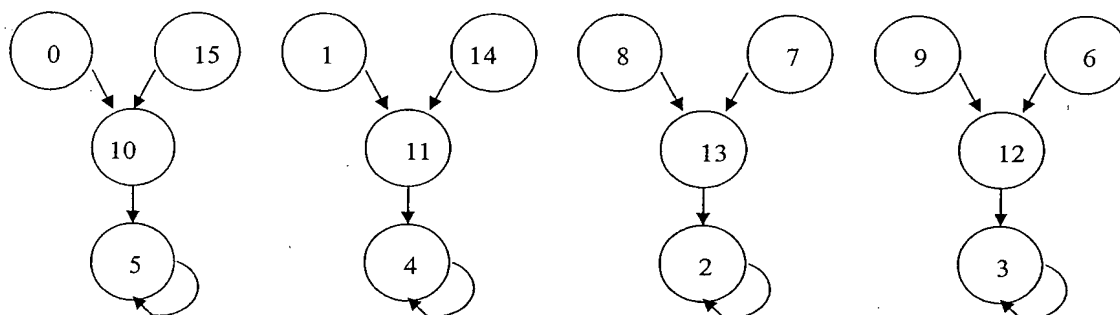


Fig. 3. State transition diagram of a non-maximum length group CA



(a) Structure



Zero - tree

$$T = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix} \quad F = \begin{bmatrix} 1 \\ 0 \\ 1 \\ 0 \end{bmatrix}$$

$n = 4$

Non reachable states = 0, 15, 1, 14, 8, 7, 9, 6

Attractors = 2, 3, 4, 5

(b) T matrix, F-Vector and State - Transition Diagram

Fig. 4. Structure and Behaviour of a Four - Cell non - group CA  
 (also referred to as Multiple Attractor CA (MACA))

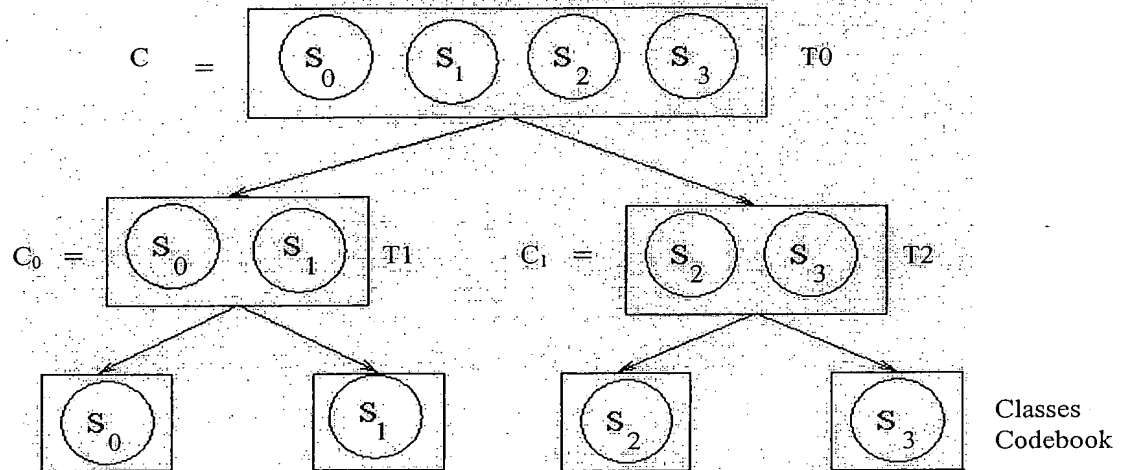


Fig. 5. The logical Structure of multi-class Classifier designed with multi-stage two-class classifiers

Note:

- (i) Each classifier is a MACA having the states of one subset of attractor basins belonging to one class while that of the other subset covers the elements of the second class.
- (ii) The PEF (Pseudo Exhaustive Field) field of attractor is used as the address to access 1 bit Index Memory (36 in Fig 1 (b)) that stores 1 bit (0 or 1) class information of two-class classification.

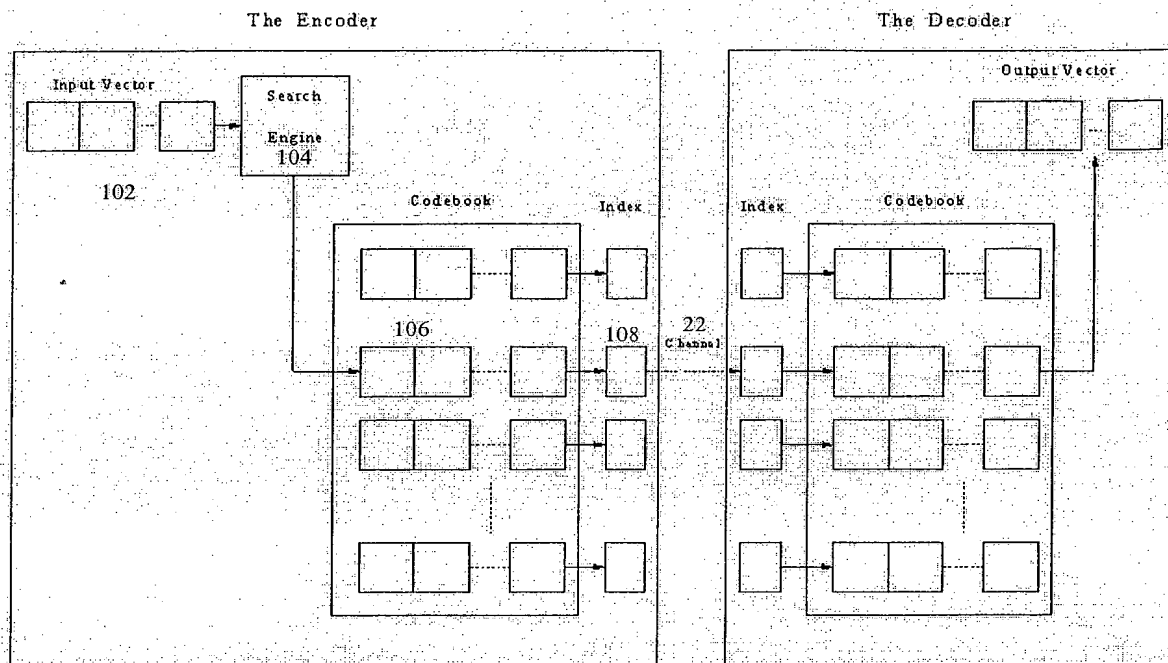


Fig. 6. Encoder and Decoder

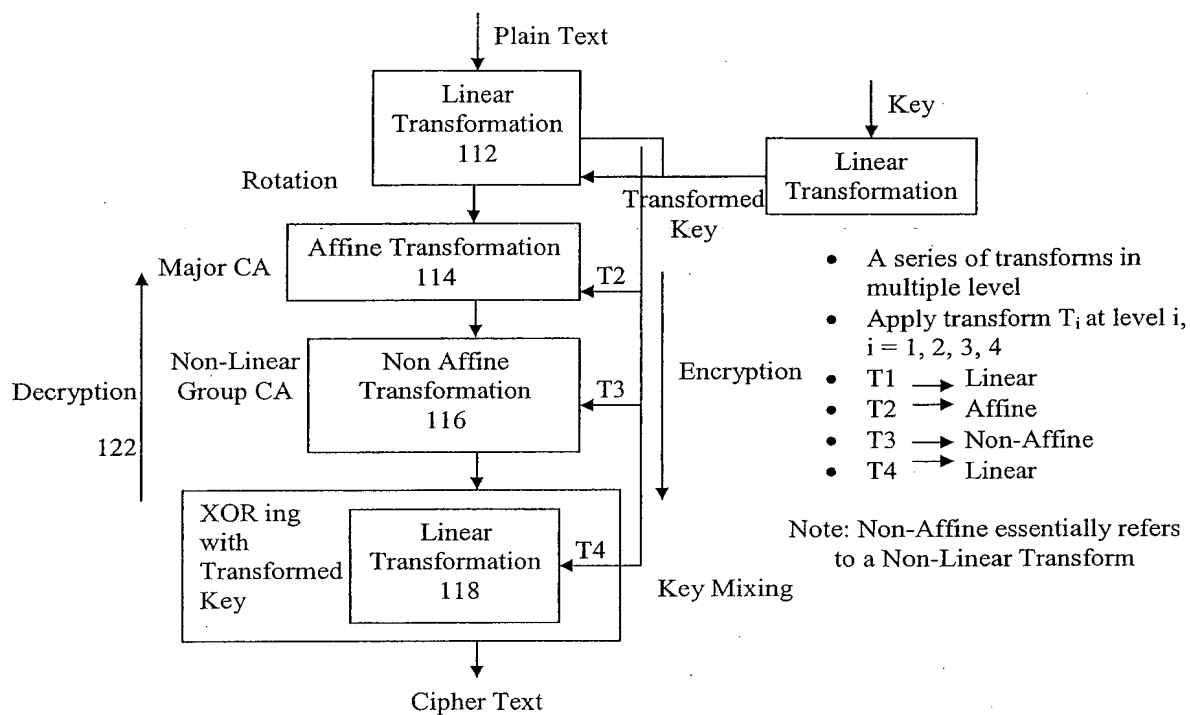


Fig. 7. Block Diagram of Encryption Scheme integrated in the Encompression Algorithm